We claim:

1. A moving or stationary armature of a polyphase electrical machine comprising a plurality of identical magnetic circuit components, the components being distributed uniformly in a direction of motion and separated by a magnetic air gap in a plane perpendicular to an air-gap surface between a stator and a rotor, the components being used for magnetic coupling to another machine part having poles alternately magnetized North-South in the direction of motion, with the other machine part being separated from the components by an air gap to allow for motion, where a circuit of each component comprises:

a plurality of claws, the claws arranged in a plurality of rows,

wherein a base of each claw in a same row is connected to a common yoke; and

one or several coils wound on a base of corresponding claws,

wherein one or several coils have an axis perpendicular to the air-gap surface.

2. An armature according to claim 1, wherein the armature has characteristics of:

$Mph > 1$;

$Nseg = k1 \times Mph$ ($k1$ is an integer greater than 0);

$G2 = G1 + 1$ or $G2 = G1 - 1$;

$G2 > 0$;

$Nb = k2$ ($k2$ is an integer greater than 0 but lower than $G1 + 2$),

wherein:

Mph is a number of phases;

Nseg is a total number of identical magnetic circuit components regularly distributed along the direction of motion;

Nb is a total number of coils distributed along a row of claws in one armature segment;

G1 is a number of claws in each magnetic circuit component, this number referring to claws in a row that are supporting the coils; and

G2 is another number of claws in each magnetic circuit component, this number referring to claws in a row that are not supporting any winding.

3. A magnetic circuit component used in an armature according to claim 1, made from a plurality of parts, each including a row of claws.

4. A magnetic circuit component according to claim 3, wherein the magnetic circuit component comprises three parts fastened together, with each part including a row of claws, and with the coils mounted on a central part, and with two opposing parts being identical.

5. A magnetic circuit component according to claim 3, wherein the magnetic circuit component is made at least in part from composite magnetic material of metal powder formed by pressing, molding, or machining.

6. A magnetic circuit component according to claim 3, wherein the magnetic circuit component is made at least in part from laminated magnetic material formed by punching or machining.

7. A magnetic circuit component according to claims 3, wherein a top surface of each claw has a rectangular, triangular, or trapezoidal shape.

8. A magnetic circuit component according to claim 3, wherein a plurality of the claws are slotted or grooved.

9. A magnetic circuit component according to claim 3, incorporating claws having surfaces adjacent the air gap, which are enlarged with respect to their base in different directions.

10. A magnetic circuit component according to claim 3, wherein bases of the claws possess rectangular, oval, or circular sections with rounded sides or corners.

11. An electrical machine comprising a plurality of magnetic circuit components according to claim 3, wherein some components are stacked along their axes of rotation with or without a magnetic air-gap between them.

12. A magnetic circuit component according to claim 3, further including an integral cooling system made of composite magnetic materials.

13. An armature according to claim 1, wherein the armature is a stator armature associated with a rotor that is split in several parts along the direction of motion.

14. An armature according to claim 1, wherein the armature is a stator armature associated with a hybrid rotor realized with a plurality of rotor structures that are stacked along their axes of rotation with or without a magnetic air-gap between them.